

**ABSTRACT**

A fluorescent protein (bFP) having chemiluminescence activity is a complex composed of the apoprotein of a calcium-binding photoprotein, coelenteramide or an analog thereof, and calcium ions or divalent or trivalent ions that can be substituted for the calcium ions. In the complex, the ratio of the number of molecules of the apoprotein to that of the coelenteramide is 1:1 and the ratio of the number of molecules of the apoprotein to that of the divalent or trivalent ions is 1:1 to 1:4. The fluorescent protein is used as a marker because it catalyzes luminescence of coelenterazine and has fluorescence capability. Removal of calcium ions etc. from this fluorescent protein (bFP) having luminescence activity provides a novel fluorescent protein (gFP). Mixing this gFP with the coelenterazine provides a calcium-binding photoprotein, which emit light instantaneously, enabling use as a marker.